LESSON 100

LAB

You're Fired! Combustion

Name _____

Date _____ Period _____

Purpose

To predict and test whether certain substances will combust.

Materials

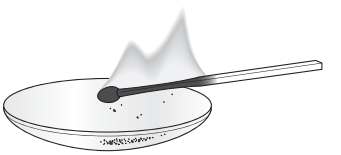
- matches
- spatula
- tongs
- burner filled with hexane
- burner filled with ethanol
- watch glass
- copper wire
- wooden splints
- zinc oxide, ZnO
- calcium chloride, $CaCl_2$
- sodium chloride, NaCl
- sand

Safety Instructions

Wear safety goggles. Know the location of the fire blanket and fire extinguisher. Use tongs to hold the copper wire.

Part 1: What Combusts?

Procedure



1. Test the substances listed in the table to see if they will burn. The liquids are in burners. Light the wicks on the burners to test them. Record your data in the table.
2. For each solid substance, use a spatula to place a small amount in a watch glass, and then apply a match to it to see if it burns. When the test is complete, empty any cooled solids into the appropriate waste container.

Data Table

Substance	Chemical formula	Type of bond	Combust?
water		molecular covalent	
wood		molecular covalent	
sand		network covalent	
ethanol			
zinc oxide			
copper		metallic	
hexane			
magnesium	Mg(*s*)		yes
calcium chloride			

Substance	Chemical formula	Type of bond	Combust?
carbon dioxide	$CO_2(g)$		no
hydrogen	$H_2(g)$		yes
helium	$He(g)$		no

Questions

1. Make a list of any patterns you notice in the substances that combust.

2. Make a list of any patterns you notice in the substances that do not combust.

3. Do you expect octane, $CH_3CH_2CH_2CH_2CH_2CH_2CH_2CH_3(l)$, to combust? Why?

4. Do you expect potassium nitrate, $KNO_3(s)$, to combust? Why or why not?

Part 2: Making Predictions and Testing

1. Examine the four substances in this table. Predict whether they will combust based on the patterns you discovered earlier. Then observe the demo.

Substance	Chemical formula	Combust? (prediction)	Combust? (outcome)	Reason for prediction
oil	$C_{21}H_{39}O_6$ (one type of oil)			
sodium chloride	NaCl			
calcium carbonate	$CaCO_3$			
iron	Fe			

2. **Making Sense** What would you want to know about a substance in order to determine whether it combusts?

3. **If You Finish Early** Why do you think marshmallows burn so well?